

# TECHNICAL MEMORANDUM

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**To:** Nevada Environmental Response Trust

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**Cc:** Nevada Division of Environmental Protection  
United States Environmental Protection Agency

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**From:** Katie Hendrickson

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**Date:** October 1, 2020

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**Subject:** Hydrogen-Based Gas Permeable Membrane Pilot Study Monthly Progress Report

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At the direction of the Nevada Environmental Response Trust (NERT or Trust), Tetra Tech, Inc. (Tetra Tech) has prepared this memorandum that summarizes Tetra Tech's progress made during August 2020 toward successfully implementing the Hydrogen-Based Gas Permeable Membrane Pilot Study.

## Task Progress Update: August 2020

### Task M26 – Hydrogen-Based Gas Permeable Membrane Pilot Study

- Current Status
  - System start-up and shakedown was initiated on July 22, 2020. Consistent with project planning, the Pilot Unit reactors were inoculated with biomass from the existing onsite Groundwater Extraction and Treatment System fluidized bed reactor (FBR) sludge holding tank on July 22 and July 29, 2020 to initiate biomass growth and acclimation in the Pilot Unit. The system has been in continuous operation since July 22, 2020 at an influent flow rate of 2 gallons per minute. On August 30, 2020, Tetra Tech concluded that all Pilot Unit controls and components were in place with performance metrics in line with design expectations. A photo log presenting pictures of the system is included as an attachment to this monthly progress report.
  - Test Scenario #1, which involves treatment of the existing FBR influent (groundwater collected from the EQ tanks), began on August 31, 2020. During the startup phase of Test Scenario #1, it is anticipated that biomass growth acclimation will continue as operational parameters are optimized until a steady state condition is achieved.
  - The Hydrogen-Based Gas Permeable Membrane Pilot Study System Operation Manual was submitted to NDEP on July 29, 2020.
- Schedule and Progress Updates
  - It is anticipated that steady state for Test Scenario #1 will be achieved in September 2020. Once steady state is reached, performance assessment sampling will be initiated and the results of the steady state performance sampling will be reported in future monthly progress reports. The

September 2020 report will include available analytical data and field parameters from the influent, effluent from each reactor and final effluent..

- Health and Safety
  - There were no health and safety incidents related to Task M26 during August 2020. Safety measures continue to be implemented to minimize potential exposure to COVID-19, including the use of face coverings, gloves, and hand sanitizer, as well as protocols for monitoring temperatures, minimizing the number of people on site at one time, and evaluating tasks to increase physical distance between personnel.

## CERTIFICATION

### Hydrogen-Based Gas Permeable Membrane Pilot Study Monthly Progress Report

**Nevada Environmental Response Trust Site  
(Former Tronox LLC Site)  
Henderson, Nevada**

**Nevada Environmental Response Trust (NERT) Representative Certification**

I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of NERT. Based on my own involvement and/or my inquiry of the person or persons who manage the systems(s) or those directly responsible for gathering the information or preparing the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

Office of the Nevada Environmental Response Trust

Le Petomane XXVII, not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

**Signature:** Jay A. Steinberg not individually but solely as President, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

**Name:** Jay A. Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

**Title:** Solely as President and not individually

**Company:** Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

**Date:** 10/1/2020

## CERTIFICATION

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I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been prepared in a manner consistent with the current standards of the profession, and to the best of my knowledge, comply with all applicable federal, state, and local statutes, regulations, and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

**Description of Services Provided:** Prepared Hydrogen-Based Gas Permeable Pilot Study Monthly Progress Report.



**Kyle Hansen, CEM**  
Field Operations Manager/Geologist  
Tetra Tech, Inc.

October 1, 2020

Date

Nevada CEM Certificate Number: 2167  
Nevada CEM Expiration Date: September 18, 2022

## **Attachments**



## Hydrogen-Based Gas Permeable Membrane Pilot Test

- ✓ Completed factory buildout and factory acceptance testing of Pilot Unit
- ✓ Constructed on-site secondary containment area and installed influent water tanks prior to Pilot Unit delivery
- ✓ Pilot Unit delivered in two containers on July 7, 2020 and lifted in secondary containment
- ✓ Completed electrical connections
- ✓ Installed discharge line to GW-11 Pond, SLMW connection, and system piping between influent tanks and Pilot Unit containers,



[www.tetrattech.com](http://www.tetrattech.com)

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HENDERSON, NEVADA

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Membrane Pilot Test**

Project No.:117-7502020-M26

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Page No.

1 of 5





Secondary containment constructed and influent tanks installed.



Pilot unit delivery.



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Page No.

2 of 5





Crane setup to place Pilot Unit containers.



Post-treatment container.



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Page No.

3 of 5





Pilot Unit treatment container.



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Page No.

4 of 5





Influent tank recirculation pumps and piping.



New transformer for electrical connection.



Pilot Unit discharge to the GW-11 Pond with protective ramp.



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Page No.

5 of 5